sudden blow on a muscle producing contraction is the same as the normal nerve impulse received through the nerve. The result is more or less the same because the same mechanism is set to work in the muscle or in the egg, but it would be misleading to infer that, therefore, the stimuli are themselves alike because they produce nearly similar results.

Reissner's fibre in the canalis centralis of vertebrates. Porter Edward Sargent.

Reissner in 1860 described in Petromyzon a cylindrical rod or fibre lying in the canalis centralis. His discovery was confirmed three years later by Kutschin who named it Reissner's fibre. Its presence has since been noted in a considerable number of fishes by three other investigators. By these it has been generally considered an artifact formed by the coagulation of the cerebro-spinal fluid.

Researches carried on during the past year has proved it to be a continuous fibre extending through the whole length of the canalis centralis and into the brain ventricles, and constituting an integral part of the central nervous system of *all* vertebrates.

As its posterior end Reissner's fibre gives off fine processes which pass peripherally between the epithelial cells forming the walls of the canal into the nervous substances of the cord. Anteriorly it extends forward through the fourth ventricle to the anterior region of the third ventricle, where after dividing several times each, division enters the torus longitudinalis posterior and ventral to the posterior commissure. Within the torus the divisions of Reissner's fibre divide many times, becoming eventually distributed to the ectal region of the optic lobes. In cross section the fibre shows a thin myelin sheath, and the central portion has a punctate appearance. Studniscka's recent deductions as to the nature of the fibre are shown to be incorrect and drawn from insufficient data.

The development in Amia and some other Teleosts has been worked out. Shortly after hatching some of the neuroplasts in the anterior portion of the optic tectum become differentiated, increasing greatly in size. By the second day after hatching these twenty to thirty cells send out processes which grow downward, penetrate into the third ventricle and growing posteriorly, coalesce to form Reissner's fibre. By the end of the second day this has grown posteriorly through the aqueduct of Sylvius and by the third day through the whole length of the canalis centralis.

The following papers were read by title:

'Ingestion of follicle cells by the ovarian ovum of the rat,' by Maynard M. Metcalf.

'Newly found parallels between dinosaurs and birds,' by Henry F. Osborn.

'Terminal nerve cells in the skin and fate of the lateral line organs in Amphibia,' by C. L. Herrick.

'The nervous apparatus in the saccus vasculosus in *Acipenser*,' by J. B. Johnston.

'The giant cells in the spinal cord of Catostomus,' by J. B. Johnston.

'A suggestion as to the meaning of the periodical degeneration which occurs in some compound ascidians,' by Maynard M. Metcalf.

'New observations upon the structure of Octonemus,' by Maynard M. Metcalf.

'New England species of Glossophonia,' by W. E. Castle.

'Notes on the tracheal system in *Neuroptera*,' by G. C. Scott.

'Demonstration of photomicrographs in cytology,' by Katharine Foot.

'A case of regeneration of the end of a human finger,' by W. E. Ritter.

'On the multiplication of arms in the twenty-rayed starfish *Pycnopodium helianthoides*,' by W. E. Ritter.

'Notes on regeneration and regulation in Planarians,' by F. R. Lillie.

J. S. KINGSLEY,
Secretary.

SCIENTIFIC BOOKS.

Leitfaden der Kartenentwurfslehre für Studierende der Erdkunde und deren Lehrer bearbeitet von PROF. DR. KARL ZÖPPRITZ *in zweiter neubearbeiteter und erweiterter Auflage herausgegeben von* DR. ALOIS BLUNDAU. Erster Theil: Die Projectionslehre. Mit 100 Figuren und zahlreichen Tabellen. Leipzig, B. G. Teubner. 1899.

The first edition of Zöppritz' 'Leitfaden der Kartenentwurfslehre,' a volume of 162 pages, appeared in 1884, and treated of projections, topographical drawing, plotting of itineraries and other matter more remotely connected with the construction of maps, such as the astronomical determination of geographical positions, constructions of geometrical curves, etc. The reputation of the author and the variety of contents secured a favorable reception to the volume, but it is a singular fact that its chief merit, that of opening a warfare upon the almost universal practice of misusing projections, should have been the least appreciated. Zöppritz was the first one in Germany who recognized the far-reaching importance of Tissot's investigations concerning distortions of projections and utilized them for his work, but the innovation was coldly received by German geographers. It was not until two years after Zöppritz' death, in 1887, that Hammer took up the fight and by his masterly translation of Tissot's mémoire succeeded in securing foothold for Tissot's ideas in the German scientific mind, and thus removed the last doubt about an ultimate victory of the principle "that the proper selection of a projection for a special purpose is not, like fashion, a matter of custom and taste, but dictated with analytical rigor," and thus prepared the way for a new edition of Zöppritz' 'Leitfaden.' The first part of this new edition, now in our hands, treats of projections exclusively and will be followed by a second volume, devoted to topographical drawing. No disparagement of the memory of Zöppritz is implied, but a tribute is paid to the sound judgment and industry of his successor, Blundau, for the proper assimilation of the new information and experience accumulated since Zöppritz' death, if I make the statement that the present edition is superior to the first one by a more exhaustive and systematic treatment of the subject in hand, by a general application of Tissot's tests and by the subordination of mere geometrical construction to computation.

The 'Leitfaden' was designed primarily as a guide to students and professors of German universities; and it is a significant indication of the conditions prevailing in these institutions, that Zöppritz should have deemed it necessary to apologize for the introduction of two or three formulas of spherical trigonometry, and that Blundau should make it a rule to avoid calculus; and in several instances, such as in giving the formula for equatorial distances in Mercator's projection, to rather omit the proof.

In passing over the contents of this volume in cursory review, I propose to pause only when meeting meritorious projections, which appear to have been neglected in this country, or such as recommend themselves to cartographers for special purposes.

Azimuthal projections.—This class of projections, although of considerable antiquity, has of late years become almost totally neglected. Many of them possess peculiar properties not found in any other projections which make them well suited for special purposes. Blundau introduces a very salutary departure from the usual practice of treating these projections separately by stating their common properties and the distinguishing features of each kind. It is a common property of all azimuthal projections that every point on the surface to be represented is shown in its true azimuth from a central point, and the distinguishing feature of each kind is the particular function of the spherical zenith distance of the point from the center of the map which is adopted as a measure of its distance, or $m = f(\delta)$, where m represents the radius or distance from the center of the map, and δ the zenith distance. The first projection coming under consideration is *Postel's*, in which the distances are given by the arcs